



The New Voice

Strategies for Implementing Voice Over Internet
Protocol Technologies in State and Local Government

A STRATEGY PAPER WITH INSIGHT FROM

CENTER FOR
DIGITAL
GOVERNMENT



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INTRODUCTION

The familiar telephone technology of today is rapidly changing as many offices in the private and public sectors adopt what is widely known as Internet Protocol (IP) telephony. This emerging telecommunications technology is creating organizations where people plug their handsets and laptops into any plug, anywhere, and their phone calls, voicemails and e-mails find them.

Gone are the separate wires connecting the phone jacks to the telephone switch and the wires connecting computer plugs to the server. Now technicians move phone and computer lines with a click of the mouse, rather than rerouting wires in the back room.

IP telephony has emerged as the new mainstream in telecommunications bringing with it the promise of reduced phone costs, greater flexibility, a broad range of new features, such as voice messages through e-mail, and the opportunity to use the underutilized bandwidth that sits idle on networks and the Internet.

Known also as Voice over Internet Protocol (VoIP), this Internet-based technology is poised to replace Plain Old Telephone Services (POTS) with long-promised, but now-delivered Pretty Amazing New Services.

Recent technology improvements in the quality of the IP voice are fueling IP telephony and VoIP's growing populari-

ty; IP voice is equal in quality to traditional circuit-based voice networks. A recent study indicates that the number of VoIP subscribers will increase to approximately 17.5 million by 2008¹. Deloitte Services LP estimates that two-thirds of the so-called "Global 2000" largest corporations will begin the migration to VoIP by 2006². In the United States, a separate study indicates that 62 percent of U.S. corporations are using VoIP and 19 percent are conducting pilots³.

This paper provides insight for government leaders for strategic decision-making in migrating toward converged networks. Defining VoIP, investigating its background and current industry trends, and briefly looking under the hood to see how the technology operates, this paper strives to enable government leaders to understand this new Internet technology and how it can benefit state and local government.

By shedding light on how other government leaders have implemented VoIP, this paper also provides a look at the overall savings and return on investment (ROI) so that leaders can build the case to implement VoIP as a strategic investment. Finally, this paper provides implementation options for VoIP systems to help leaders start moving toward convergence in the public sector and making VoIP a reality.

¹ The Yankee Group

² Caron Carlson, "VoIP: A New Day is Dawning," *eweek.com*, December 6, 2004

³ Nemertes Research, "Convergence: Reality at Last"

DEFINING IP TELEPHONY AND VoIP

Both IP telephony and VoIP offer the opportunity to send and receive voice messages over the Internet just like e-mail messages, with the former offering an enterprise-wide solution and the latter enabling an incremental approach. Often used interchangeably, IP telephony and VoIP describe converged digital networks from different ends.

IP telephony is an all-digital technology that supports voice, data and video transmission via IP-based Local Area Networks (LANs), Wide Area Networks (WANs), and the Internet.

VoIP is an essential component of an “any-to-any” converged network through which voice, data and video are sent and delivered from any device to any device. For example, a city may outfit a new building with VoIP to handle voice and data over a LAN, while its existing buildings rely on conventional phone networks for voice and LAN networks for data. Alternately, an expanding government department or entity with a fragmented phone system may run out of extensions and choose to retrofit with VoIP. Whether an enterprise-wide or incremental implementation, conventional phone costs are reduced dramatically.

In both systems, analog voice messages are digitized and transmitted as a stream of data (not sound) packets that are reassembled and converted back into a voice signal at their destination. In other words, packets of voice data travel through the Internet or private networks just like e-mail.

What is different is that with IP telephony and VoIP, voice information is delivered as IP-based digital packets instead of through the current circuit protocols used in conventional, copper-based phone networks. With IP telephony and VoIP, voice is no longer a separate

network, but one of many optional communications applications available on the same network.

[Telephony: The science of translating sound into electrical signals, transmitting them, and then converting them back to sound; the science of telephones. The term is used frequently to refer to computer hardware and software that perform functions traditionally performed by telephone equipment. For example, telephony software can combine with your modem to turn your computer into a sophisticated answering service. Voicemail is another popular telephony application.]

BACKGROUND AND INDUSTRY TRENDS

IP telephony and VoIP services are gaining ground in the public and private sectors because of recent telecommunications improvements and the major benefits organizations and end-users receive from the products. Voice applications on IP networks have been an evolving concept over the last 20 years. VoIP will capture a significant portion of the conventional market, given the fiscal savings and flexibility that it can provide⁴.

Organizations began using VoIP phones in the 1990s to eliminate the need for two separate networks for phones and computers and to rely on a single network for voice and data. However, early VoIP solutions were largely proprietary, mostly contained within corporate net-

works and difficult to integrate with legacy applications and business processes. These VoIP pioneers also suffered from volatile voice quality.

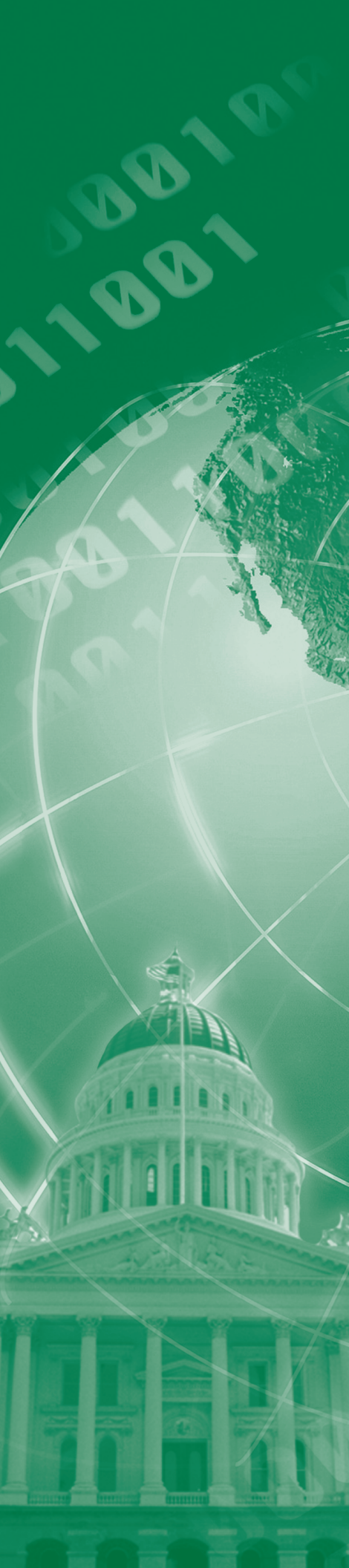
With continuing technology improvements, which place IP voice quality on par with traditional circuit-switched voice networks, VoIP is gaining organizational ground as the next generation of phone technology service.

In many respects, VoIP is just-in-time technology that anticipates and matches the changing manner in which people are accessing and managing information. Place-bound communication technology is at odds with the way people work and live. VoIP technology offers users the opportunity to access voice-mail from anywhere an Internet connection exists.

With Session Initiated Protocol (SIP), an open standards signaling protocol, VoIP systems can manage instant messaging, presence, conferencing, and event notification. Presence, which detects whether a person is online, renders the phone part of an integrated communication tool that combines instant messaging, e-mail and voice. People can log on or plug in wherever they are and their respective calls, computer networks and faxes will find them. In addition, VoIP provides a much-needed service to the visually impaired.

[Session Initiated Protocol: A signaling protocol for Internet conferencing, telephony, presence, events notification, and instant messaging. The protocol initiates call setup, routing, authentication, and other feature messages to endpoints within an IP domain.]

⁴Dr. Richard Kuhn, Thomas J. Walsh, Steffen Fries, “Security Considerations for Voice Over IP System, Recommendations of the National Institute of Standards and Technology,” January 2005



The city of Houston has been using VoIP for approximately three years. Currently, the city's public libraries, Information Technology Department, and smaller operations in the police department represent its 800-900 phone users.

According to Janis Jefferson, deputy director of the city's Information Technology Department, "Convergence of our voice and data networks to reduce telephone circuit cost and increase support efficiencies was the primary driver for our VoIP implementation. Another significant driver is that our current environment is a patchwork of disparate phone systems with no common dialing plan, inability to transfer voice messages citywide and obsolete PBX platforms."

In October 2004, the city of North Las Vegas implemented VoIP in a new police substation with 50 phones and is getting ready to convert another 250 phones in its new justice facility. Like the city of Houston, North Las Vegas was unhappy with its present phone system support and cost.

The city had the fiber backbone to switch to VoIP, but needed to build in redundancy to ensure service. It added redundant switches and loops, universal power supply, and generator backup to critical areas.

Under the new system, the North Las Vegas police use a soft phone to log in and pick up messages. A soft phone is an application that enables a desktop, laptop or workstation computer to function as a telephone. The service includes integrated e-mail and find-me/follow-me features so users can forward voice to e-mail, cell phones, PDAs, or home phones.

According to Ila Kowalski, the city's IT manager, "We are serving 50 people with 15 direct dial lines instead of 65 for digi-

tal devices, faxes and desktops. So, we're using one-third of what we would need in a conventional phone environment."

Last summer, the state of North Carolina piloted VoIP in a new IP-based, 350-seat call center for its Department of Revenue. The state's initial network wasn't providing the resiliency or Quality of Service (QoS) — technical characteristics of mainly non-time-dependent data transmission — it wanted, so it upgraded its core bandwidth to an IP network, partitioned in virtual private networks, and implemented Multi-Protocol Label Switching (MPLS). The MPLS allows VoIP to deliver the QoS the state requires.

THE EMERGENCE OF VOICE AS JUST ANOTHER NETWORK APPLICATION

Conventional phone networks — and the entire telephone industry — grew up around voice and elaborate voice-only networks. The Internet, specifically IP telephony and VoIP, challenges over 100 years of voice-centric thinking. Today, voice is just another application on a converged network that also carries video and data from anywhere to anywhere, from any device to any device.

VOIP AND THE CONVERGED NETWORK

Just a few years ago, convergence — the coming together of two or more disparate disciplines or technologies — was a much-hyped buzzword⁵. Today, convergence has become so real and significant that it holds rank as one of the decade's most powerful drivers — not only in systems, but also in companies, jobs and industries. VoIP and the converged network bring the promise of consolidated applications, greater LAN/WAN flexibility, a feature-rich user experience, and cost reductions.

⁵ Steven Levy, "Getting the Whole World in Your Hand," *Newsweek*, January 17, 2005:21

CONSOLIDATED APPLICATIONS

In the telecommunications industry, convergence integrates voice, video and data into one seamless delivery system, with bottom-line results. The potential savings in consolidating hardware, software and network maintenance and troubleshooting into one network are what make IP telephony and VoIP so attractive to organizational leaders and IT managers.

By combining telephone calls and data that is delivered over LANs and high-speed domestic broadband connections into a single service, organizations eliminate the need to maintain separate networks. Left with only a network application and no conventional phone network, organizations may profit from using the same network engineers who troubleshoot the data infrastructure to troubleshoot the voice network, given the proper motivation and training.

As with any network, however, organizations should pay careful attention to the design, deployment, and secure operation of an IP telephony or VoIP network. If taking an incremental VoIP approach, organizations must investigate how the current data network is laid out to find the right solution that fits their needs now and can grow into the future. Alternatively, organizations without the resources to convert incrementally or to manage an enterprise-wide converged network have the option of outsourcing to a hosted IP telephony or VoIP vendor.

The city of Coral Springs, Fla., is currently

looking to transition its conventional phone network — an old PBX system with archaic connections to the outside world, which are no longer supported, but the public switched telephone network is still supported. In the short term, the city expects to reduce its operating costs and decrease business risks related to

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voice services. In the long term, the city expects to leverage its investment by reducing cycle times and costs associated with implementing new solutions and services that are IP telephony-based.

In 2002, Coral Springs upgraded its private network and purchased network equipment with the intention of using it for voice purposes in a VoIP environment. The city sees integrated personal devices

becoming more the default remote (Internet, extranet, intranet) access tool, and its transition will “give us better alternatives going forward,” according to Jim Cerny, director of Information Services.

The city chose a hybrid approach so that it can integrate IP-based technology as it can afford it. Starting “incrementally allows the city to control and manage the cost, use and success in deploying VoIP technology. And the business risk goes down,” notes Cerny.

LAN/WAN FLEXIBILITY

With an incremental or enterprise-wide conversion, the phone system becomes just another IT network application with gateways, routers, firewalls, and protocols — all on a single pipe with back-up capabilities.

VoIP technologies leverage fast (Ethernet and Gigabit Ethernet) backbone connections so that VoIP phones or handsets can be plugged into any Ethernet port on the LAN environment. Even an incremental approach, which reduces the number of conventional phone circuits an organization requires, can provide substantial cost savings as the cities of Houston and North Las Vegas substantiate.

In addition to consolidating management and maintenance, VoIP allows network administrators to take advantage of excess broadband capacity for voice, fax and data transmission, while utilizing the Internet and organizational intranets as less costly solutions.



A HYBRID END-USER EXPERIENCE

For the end user, VoIP offers a feature-rich Web interface or dashboard that enables users to click and point their way to a hybrid of messaging features, such as find me/follow me rules, click to call, conferencing, unified messaging, and presence, which detects whether a person is online.

Through the dashboard, users can access their features, modify service settings, which can route calls based on the features selected, and obtain assistance and tips. Many dashboards integrate with popular e-mail programs, such as Outlook, Eudora, Opera, or others.

In addition, customers have access to specific call logs to review all calls placed and received by date and time. This access gives organizations the opportunity to track and bill all outbound and incoming calls.

One nationwide VoIP service provider is Qwest Communications International Inc. Qwest was one of the first major communications companies to roll out a VoIP offering and today carries more than two billion minutes of VoIP traffic across its national fiber-optic network.

For government organizations looking to implement VoIP, Qwest offers several solutions that can be tailored to organizations' different sizes and needs. The Qwest suite of VoIP services is called OneFlex™ and is available in more than 200 cities in the U.S.

OneFlex hosted VoIP provides real-time, two-way voice capability in a new fully-hosted service that replaces a premises-based phone system and the multiple vendors required to provide popular applications like voicemail and integrated messaging. The features and applications are delivered to the customer's handset via a single dedicated Internet access connection, which

Qwest can also provide. These features can be individually customized by the user through a personalized Web portal. For the customer, the solution provides centralized management and control, allowing the business to perform its moves, and adds and changes from an Internet connection.

OneFlex Managed Internet Protocol Telephony (IPT) is a nationwide, customer premises equipment-based VoIP solution for businesses and government organizations. It offers clients plug-and-play functionality. OneFlex Managed IPT provides all necessary hardware, software, licenses, installation, maintenance, and 24/7 application management and monitoring through a fully-bundled IP telephony service that includes a convergence readiness assessment.

OneFlex Integrated Access is an IP-based solution that integrates local and long-distance voice and data traffic on a single connection. It uses VoIP technology to give customers the advantage of using more bandwidth for data traffic when phones are not in use. Voice traffic has priority over data. When phones are in use, bandwidth is automatically allocated from data to voice.

COST REDUCTIONS

According to a new study conducted by Nemertes Research, VoIP offers organizations substantial cost savings. The report states that large organizations can save between \$9,600 and \$28,000 per site annually on local loop costs by converging their networks, and mid-sized organizations can realize annual cost reductions of between \$4,800 and \$9,600⁶.

However, the start-up costs can be affected by numerous variables, including size of organization, vendor companies that supply the VoIP solution, hardware for handsets, planning and implementation

⁶ Nemertes Research "Convergence: Reality at Last," 2004

services, and network assessments to determine if existing data networks are ready to carry voice traffic.

DEFINING CHARACTERISTICS OF CARRIER-CLASS VOIP

Carrier-class VoIP refers to VoIP services provided by the major telecommunication carriers, including long-distance providers and Regional Bell Operating Companies. These major carriers have merged the possibilities of VoIP with the power of their respective infrastructures, business communications, and expertise to offer converged communications on reliable, scalable and secure networks.

Along with improved voice quality, VoIP technology has advanced in reliability, interoperability, security, and emergency 911 services – largely due to newly created government and industry standards and procedures⁷. Carrier-class vendors offer broad portfolios of VoIP solutions suitable for corporate networks, branch offices, remote workers, and call centers.

RELIABILITY AND RESILIENCY OF THE INTERNET

As carrier-class VoIP vendors bring service level agreements, which codify quality expectations to the forefront, reliability, a major concern to organizations, continues to improve. Along with reliability, interoperability is advancing because of the rise of open standards-based tools and protocols, such as SIP and Media Gateway Control Protocols (MGCP).

SIP is the specified protocol for initiating a two-way communication session. As an application level protocol, SIP is decoupled from the protocol layer it is transported across. It has a number of security mechanisms. Some, such as HTTP authentication, have been built directly into the SIP protocol⁸.

Media Gateways focus on the audio signal translation function, performing conversion between the audio signals carried on telephone circuits and data packets carried over the Internet or other packet networks. At the present time, MGCP is the de-facto industry standard⁹.

These open-standards-based protocols help to provide the interoperability and scalability that organizations require for next-generation communication applications, such as VoIP.

ALWAYS ON AND AVAILABLE

Another defining characteristic of VoIP is the capacity and quality required for the network to operate successfully. If VoIP does not deliver at least the same amount of voice quality as a traditional telephone network, then in the end the product provides little value. Cost savings and rich features will also be tossed aside if the quality does not satisfy business needs and user expectations. The best way to ensure that the network is always on and available is to ensure enough bandwidth is available and that the voice packets can travel quickly and securely through the network.

Ironically, the more security measures implemented, the more degradation that can occur to the QoS, including availability, latency, jitter, and packet loss.

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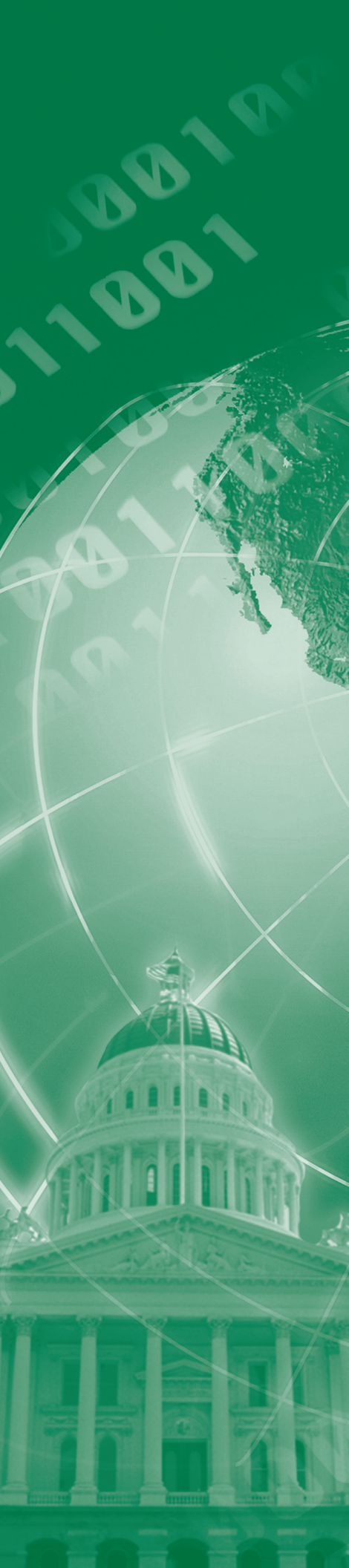
Availability refers to the bandwidth allocation reserved for the network to share both data and voice over the same wires. If the bandwidth is congested, packets can be queued, which can then cause latency delay (the time it takes for a voice transmission to go from its source to its destination) and jitter, where packets arrive and are processed out of sequence.

The worst-case scenario is when delayed latency and jitter causes packets to be lost, which severely degrades the QoS in a VoIP network. Carrier-class VoIP

⁷ See note 4

⁸ See note 4

⁹ See note 4



vendors ensure enough bandwidth is available to allow for the speed required for optimum QoS. One of the ways to increase speed is through MPLS, which speeds up packet forwarding in IP networks.

SECURITY BY OBSCURITY: AN ELEGANT DESIGN

One of the main sources of confusion for those new to VoIP is the (natural) assumption that because digitized voice travels in packets just like other data, existing network architectures and tools can be used without change¹⁰.

Many security measures implemented in traditional data networks are not enough for VoIP to be secure. Firewalls, intrusion

"HOSTED IP TELEPHONE SOLUTIONS ALLOW YOU TO BUY THE BENEFITS OF ADVANCED NETWORK SERVICE, WHILE OFFSETTING THE ATTENDANT RISK."

detection systems and other components must be specialized for VoIP. Through MPLS, the router is known to the Internet, but the servers, which host voice applications, are not. What is not known cannot be targeted for attack by hackers.

Along with security, special consideration should be given to emergency 911 services when deploying VoIP. In some cases, the emergency 911 automatic location service is not available. Although most VoIP vendors have workable solutions for 911 service, government regulators and vendors are working out standards and procedures for 911 services in a VoIP environment¹¹.

D. Richard Kuhn, co-author of a National Institute of Standards and Technology report on VoIP security, states "VoIP is moving ahead very, very fast in the commercial and government sectors. We don't want to scare people away from this. But we want to point out that this is a complex technology and there are a lot of security considerations that they may not have thought of. It's more than just moving data."

The range of security products for VoIP security is "pretty good" and has advanced appreciably in the last year since the report was started. "You can get the security tools, and it's a question of finding the right vendor for your needs."¹²

Security of all applications — including voice — is a cost of doing business in an uncertain world. Being your own telephone company is a non-trivial matter, so is providing your own security. As discussed below, hosted IP telephone solutions allow you to buy the benefits of advanced network service while offsetting the attendant risk.

BUILDING THE CASE TO IMPLEMENT VOIP AS A STRATEGIC INVESTMENT

As local and state government organizations grow and conventional phone systems and services wrestle with obsolescence, many leaders have, or soon will, come face to face with the question of whether to invest in POTS or take the next step toward VoIP.

COST EFFECTIVENESS

The beauty of VoIP is that it offers modernization on a scale that provides a decent ROI. VoIP makes economic sense for entities already planning to significantly upgrade or rebuild their networks because of obsolescence or cost control, as the cities of Houston and North Las Vegas attest: those with a high volume

¹⁰See note 4

¹¹See note 4

¹²Matt Hamblen, "NIST Report Urges Caution with VoIP Security," *Computerworld*, January 26, 2005

of long distance calling expenses or local toll charges because of fragmented phone systems and startups.

For the risk-averse, VoIP allows organizations to make a controlled change — either through a pilot program or transitional step — to test the waters. Always alluring is the promise of immediate cost reductions and ROI by simply reducing the number of conventional phone circuits.

If organizations choose to make the strategic investment for a small pilot, they must weigh the costs of continuing to retain in-house telecom staff, retrain in-house LAN/WAN staff to install and maintain the voice network, bring in a third-party vendor to set up the network, or outsource the installation, management and maintenance to a VoIP-hosting vendor. For environments without the resources to maintain in-house systems, hosted VoIP services will serve as a low-priced entry into the world of telephony¹³.

EFFICIENCIES

Efficiencies include the ability to enhance functionality, such as North Carolina's integrated call center, geographic transparency, and replacement of obsolete technology with more cost-effective and efficient solutions.

THIRD-PARTY HOSTING

Third-party hosting is an option for organizations that wish to outsource telecommunications technology — such as running and managing LANs and phone

circuits — to remain focused on their core services. Many, if not all, telecommunications vendors have leveraged their expertise and infrastructure to offer VoIP solutions designed to improve cost efficiencies, simplify network management, and create flexible platforms that are scalable to organizational needs.

Finding the right hosting package that meets an organization's needs should not take excessive time and effort, but there are a few factors to consider. A VoIP hosting provider should have several of its own modern data centers with redundant operations for business continuity and disaster planning. Security is a major consideration particularly in government sectors, so the hosting provider should have the appropriate technologies to ensure safety and integrity of data and voice.

For example, Qwest has eight state-of-the-art data centers, known as CyberCenters™, throughout the country. They are connected directly to the company's fiber-optic network and because of the company's commitment to security and reliability, provide several government organizations, including California, with hosting solutions.

OVERALL SAVINGS AND ROI

To date, a handful of cities and states have converged wired and wireless networks with positive ROIs and cost reductions. These pioneers include the cities of Houston, with a 40 percent ROI; North Las Vegas, which reduced conventional phone

circuits by 33 percent; and Coral Springs, which is in the middle of a multi-year project and should finish in 12 to 24 months and has saved to date \$60,000 per year.

VoIP allows organizations to reduce their exposure to traditional, metered and distance-sensitive long-distance pricing by using distance-insensitive digital technology to route calls more efficiently.

VOIP IMPLEMENTATION OPTIONS

With VoIP, organizations can implement at a pace and to a level of their choosing, assuming appropriate resources and service providers are available. Implementation options include enterprise-wide or incremental transitions, pilot programs and hosted services.


TRANSITION METHODS

Organizations wishing to retrofit an old, antiquated phone system to accommodate more users or lower costs or to upgrade to new technology in a new building can use VoIP to make an incremental transition.

In this scenario, VoIP technology runs over a LAN in the defined transition area and a telecom switch routes the data outside to the existing PBX. With this incremental approach, the new or retrofitted area relies on one LAN instead of a LAN and telephone circuits, and communication is integrated between the conventional phone system and the VoIP.

Alternatively, an organization may choose to replace its entire phone system

¹³ David Greenfield, "VoIP: Choose Your Reality," *Network Magazine*, January 5, 2004



and eliminate conventional metered, distance-sensitive pricing by converting to an enterprise-wide, all-digital network.

In this scenario, the organization no longer pays for phone service by the minute, but instead is billed based on the bandwidth required to run the additional data. In cases where an organization's network has unused bandwidth capacity, it may be able take on voice data without incurring additional bandwidth costs.

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PILOT PROGRAMS AND APPLICATIONS

To minimize risk, organizations can pilot a VoIP solution in an area that is both containable for the pilot's purposes and representative of the organization, such as a new building. When planned correctly, a pilot's results can provide a near-complete preview of a full implementation.

Pilots offer the opportunity to prove the concept, experiment with how the

new technology will work in the given environment, and help flush out the changes necessary for future incremental or enterprise-wide rollouts.

For example, North Carolina is piloting its 350-seat call center as its first VoIP implementation and Houston piloted its VoIP in a 600-phone library. After Houston's successful pilot, it expanded the network to its IT and police departments, and will deploy more in the future.

HOSTED VOIP SERVICES

Hosted VoIP services offer organizations the convenience of managed solutions and the freedom to turn over network management and maintenance. Running LANs and phone circuits are no longer an organizational concern.

The benefits of hosted solutions include low capital outlays, nominal impact on existing infrastructure, service quality guarantees, ease of use, and gaining the efficiencies of a unified network. For this convenience and freedom, hosting vendors can charge high monthly fees and often require service contract commitments.

At this stage in VoIP evolution, service quality agreements are fairly new and should be discussed in detail with any potential vendor to ensure an organization is comfortable with the level of inherent risk.

Organizations can find hosted VoIP solutions whether they choose to implement an incremental approach or an enterprise-wide conversion. In an incremental approach, the hosting vendor will maintain select computers and phones on a consolidated digital network. If an enterprise-wide approach is chosen, the vendor will maintain all of an organization's voice, video and data traffic on a fully managed, converged network.

CONCLUSION:

ANY-TO-ANY, ANYTIME, ANYWHERE

Government leaders need to realize that a revolutionary change to the telecommunications industry is here, which could impact cost savings dramatically, while improving operational efficiency.

By reducing infrastructure equipment needs and staff requirements, enhancing mobility and productivity, and providing communication connectivity at diverse

locations and times, converged networks of voice, data and video transmission over IP-based LANs, WANs, and the Internet, offer the promise of major benefits.

VoIP can dramatically improve the way work gets done and even transform business models, allowing large- and mid-sized government entities to lower costs and improve efficiencies. The telecommunications industry is changing the way it does business too, offering the oppor-

tunity to move into the converged experience with several implementation options, including transition assistance and hosted VoIP services.

The IP has won the debate and government leaders are embracing a revolutionary change in the telecommunications industry, which could bring with it dramatic cost savings, while improving operational efficiency.

TYPES OF FEATURES VOIP MAY OFFER:

BASIC FEATURES:

- Unlimited local outbound calling
- Unlimited on-net calling
- 911 dialing
- Personal online dashboard with:
 - Call logs
 - Contact manager
 - Click-to-call
 - Click for voicemail
- Voicemail with:
 - E-features
 - Indicator
 - One button push
- Office administrator account profile
- Distinctive ring
- Abbreviated dialing
- Caller ID with name
- Call waiting with caller ID
- Call hold
- Call block
- Call transfer
- Call forwarding
- Smart call forwarding/personal locator
- Three-way calling
- Do not disturb
- Speed dial

ENHANCED FEATURES

- Microsoft® Outlook®
- Integration
- Integrated messaging
- Remote calling

PREMIUM FEATURES

- Business white and yellow pages listings
- Microsoft® Outlook® integration
- Integrated messaging
- Personalized set up and training and on-site office administrator training
- Site survey and personalized local area network analysis
- Business customer premises equipment customized to the location
- Off-net calls (domestic, local, toll, long distance, and international)
- Directory assistance (411)

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About Qwest

Qwest Communications International Inc. is a leading provider of voice, video and data services. With more than 40,000 employees, Qwest is committed to the "Spirit of Service" and providing world-class services that exceed customers' expectations for quality, value and reliability. Visit Qwest at www.qwest.com.